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Word Association and Schizophrenia Symptomatology

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WORD ASSOCIATION AND SCHIZOPHRENIA SYMPTOMATOLOGY

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Abstract

Research on schizophrenia in recent years has been characterized by a growing trend to dichotomize patients into separate symptom groups based on a predominance of positive or negative symptoms. Positive symptoms, such as hallucinations, are characterized by the presence of abnormal features; a better premorbid history and prognosis; and are widely thought to result from both psychosocial and neurochemical causes. Negative symptoms, such as apathy and anhedonia, are characterized by the absence of normal features; a poorer premorbid history and prognosis; and are thought to be primarily genetic and structural in origin. The growing reliance on this descriptive system for grouping schizophrenics for research studies underscores the need for a standardized assessment instrument to measure positive and negative symptomatology. One purpose of this study was to investigate the interrater reliability of the Positive and Negative Syndrome Scale (PANSS) (Kay, Fiszbein & Opler, 1987). The second purpose of this study was to test for differences in word association between positive and negative symptoms, and to examine how these associations change when placed in the context of a sentence by the patient. Although schizophrenics have repeatedly been found to associate words more idiosyncratically than normals, evidence from contextual research suggests that these responses may become more meaningful if the underlying association is disclosed in the form of a sentence designed by the patient to explain the association. Fifty inpatients at Eastern State Hospital in Williamsburg, Virginia, with DSM-III-R Axis I diagnoses of schizophrenia, served as subjects. Interrater reliability estimates were obtained from a subsample of 27 patients, rated by two raters. Pearson correlations obtained found the reliability to be $\underline{r}$ = .83 for positive symptoms and $\underline{r}$ = .54 for negative symptoms. In a single word association task, negative symptoms were found to correlate with idiosyncratic responses ($\underline{r}$ = .39) and correlate inversely with common responses ($\underline{r}$ = -.39); significance was not found with positive symptoms. In the context of a sentence, 65% of positive syndrome patients' idiosyncratic responses and 53% of negative syndrome patients' idiosyncratic responses became explained (associated). The use of the PANSS as a concise and unified instrument for assessing schizophrenic symptomatology was supported. This study demonstrated that associative thought disorder in schizophrenia may in part result from clinicians' tendency to view schizophrenic language as isolated responses, symptomatic of disease caused thought disturbance, rather than as the result of deviant meaning systems. Findings generally support the usefulness of the positive-negative symptom dimension for research description of clinical populations.

Word Association and Schizophrenia Symptomatology

Introduction

Research on schizophrenia has been characterized by a growing trend to dichotomize patients into separate symptom groups based on a predominance of positive or negative symptoms. The growing reliance on this grouping underscores the need for a standardized assessment instrument to measure negative (absence of normal features) and positive (presence of abnormal features) symptoms (Kay, Fiszbein & Opler, 1987). Kay et al. cite several carefully conceived scales that have been devised; however, none have undergone the thorough psychometric standardization needed to address content and construct validity (Sommers, 1985). The purpose of this study is twofold. First, it will investigate the interrater reliability of a new instrument which purports to rate symptomatology.

The second purpose of this study is to test for differences in word association between groups evidencing positive and negative symptoms of schizophrenia (Andreasen, 1985; Crow, 1985; Strauss, Carpenter & Bartko, 1974) and how these associations change in the context of a sentence. Schizophrenic patients have repeatedly been found to associate words more idiosyncratically than the normal population (Kent & Rosanoff, 1910; Mefferd, 1979; Moran, Mefford & Kimble, 1964; Namyslowska, 1975; Shakow, 1980; Shakow & Jellinek, 1965; Storms, 1977). Evidence suggests,

however, that these idiosyncratic responses may become more meaningful if the underlying association is disclosed (Jenkins, 1974). A contextualist approach to word association contends that idiosyncratic responses become more meaningful in the context of a sentence created by the subject to explain the purpose of the association.

Crow (1985) maintains that a two syndrome definition of schizophrenia has arisen out of a need to postulate more than one dimension of pathology underlying the disorder. This allows for more intensive and comprehensive research because symptom types can be compared as well as non-symptom types. Schizophrenia has been divided, for example, into paranoid versus nonparanoid, process versus reactive, and positive versus negative. Process-reactive schizophrenia research was popular in the 1960's and 1970's. Shean (1987) concluded the following:

> Grouping schizophrenics into process-reactive subtypes has been found to markedly reduce group heterogeneity. Research indicates that these groups can be differentiated on the following criteria: autonomic nervous system arousal and responsiveness, conceptual functioning, linguistic and associative processes, learning and performance, censure sensitivity, parent perception, and family dynamics (Higgins, 1969). This distinction is of particular value because it is based on relatively objective data and has good predictive

> validity. Reactive patients have been found to have a higher probability of discharge and brief hospitalization, for example, are less likely to be rehospitalized (Strauss, 1973), and show less psychological deficit at first hospitalization (Higgins, 1969) than do process patients. Recent evidence also suggests that process patients are more likely to benefit from major tranquilizers than some categories of reactive patients (Goldstein et al., 1969). Chapman and Chapman (1973) have reviewed the literature comparing process and reactive patients and conclude that these groups can be reliably differentiated on the following measures: problem solving, proverb interpretation, abstract thinking, and word associations. The performance of process patients is generally below that of reactives on each of these measures. (p.45)

The focus of recent studies has shifted from the premorbid adjustment patterns that determine placement on the process-reactive dimension to the symptom-focused negative and positive dimension described by Crow (1980). Negative symptoms are identified as a defect state. They are characterized by a loss of cognitive functioning, abnormal involuntary movements, and behavioral deterioration (Crow, 1985). Negative symptomatology is evidenced by emotional and social withdrawal, blunted affect, apathy, and

poverty of speech and thought. The symptoms appear insidiously (Andreasen, 1985), are correlated with a poor premorbid status, are thought to be chronic and irreversible, and can affect later functioning (Pogue-Geile & Harrow, 1984). Pogue-Geile and Harrow maintain that these symptom patterns are persistent and trait-like. Negative symptoms have also been associated with impaired neuropsychological testing and inversely correlated with intelligence (Zubin, 1985).

The most popular view of the etiology of negative symptoms is that there is a structural abnormality in the brain, specifically ventricular enlargement and cell loss (Crow, 1985). Negative symptoms do not respond well to neuroleptics (Sommers, 1985). They are thought, more than likely, to result from a genetic component. Strauss et al. (1974) , on the other hand, have explained negative symptoms as resulting from vague early family communication and being treated in an impersonal manner.

Positive symptoms are characterized by a presence of abnormal features such as hallucinations, delusions, and excited catatonic motor behavior. Cognitive functioning remains normal in many respects (Crow, 1985). The symptoms have an acute onset with many exacerbations and remissions (Andreasen, 1985; Pogue-Geile & Harrow, 1985), are associated with normal pre- and postmorbid status, and are viewed as more likely to be reversible (Crow, 1980).

Since positive symptoms respond well to neuroleptics, they are considered to be biochemically related, most likely an over- or underactivity of dopamine (Andreasen, 1985). "The most widely held neurochemical hypothesis for schizophrenia suggests that the disease is associated with relative overactivity of the central dopamine (DA) systems" (Mackay, 1980, p. 379). The elevated dopamine activity in schizophrenia may be a hypersensitivity of the dopamine receptors to the effects of dopamine. Recurrent stress is thought to lead to increased dopamine release which could exacerbate psychotic (positive) symptoms.

Andreasen (1985) contends that positive symptoms can evolve into negative symptoms. Negative and positive symptom patterns can occur separately or simultaneously, the latter being more common (Zubin, 1985). Negative symptoms may continue after positive ones have subsided.

Negative and positive symptom patterns are often difficult to distinguish because they are not specific to schizophrenia. Negative symptoms can mimic depression (Zubin, 1985); postpsychotic depression (Lewine, 1985; McGlashan, 1982; McGlashan & Carpenter, 1976); drug-induced akinesia (Lewine; Van Putten & May, 1978); aphanisis, an actively maintained autistic state (McGlashan, 1982); long-term effects of hospitalization (Lewine); and schizoid personality (Sommers, 1985). Positive symptoms can look like those found in mania (Neale & Oltmanns, 1980,

pp. 456-7) and schizoaffective disorder (Cornblatt, Lenzenweger, Dworkin & Erlenmeyer-Kimling, 1985).

While researchers tend to agree on the characteristics of negative and positive symptomatology, their theories of interpretation differ. Strauss et al. (1974) first introduced the negative/positive distinction. The controversy over whether the symptoms are independent processes or if they fall on a continuum continues. In support of the view that positive and negative symptoms are independent, Crow (1980) has attempted to distinguish Type I (positive) with dopaminergic association and Type II (negative) with structural abnormality groupings. Cornblatt et al. (1985) conclude that these symptom patterns are independent on the basis of information processing differences, while Pogue-Geile and Harrow (1985) postulate independent patterns on the basis of outcome studies. Lewine, Fogg and Meltzer (1983) reviewed positive symptoms and social withdrawal as independent variables, and Bilder, Mukherjee, Rieder and Pandurangi (1985) have confirmed this finding. Finally, on the basis of genetic studies with twins, Dworkin and Lenzenweger (1984) reported evidence that positive and negative symptoms are independent.

Mackay (1980) maintains that negative symptoms are continually present with positive symptoms superimposed on the negative ones. He explains this on the basis of constant underactivity of dopamine transmission in negative

symptoms with episodes of dopamine hypersensitivity causing positive symptomatology.

Andreasen (1985), on the other hand, states that positive and negative symptoms are negatively correlated and at opposite ends of a continuum. Shakow (1962) also maintains that the symptoms lie along a continuum. Freud (cited in Strauss et al. 1974) also postulated a continuum of schizophrenic symptoms, although his observations were prior to the positive-negative categories. Further research is needed in order to draw specific conclusions about the relationship between negative and positive symptomatology and schizophrenia.

Lenzenweger, Dworkin and Wethington (1989) analyzed three competing models of the positive and negative symptom relationship: Gottesman, McGuffin and Farmer's theory of severity-liability based on clinical genetics, Andreasen's unidimensional bipolar model, and Crow's independent dual-process model. Gottesman et al.'s model describes the symptoms on a continuum with negative symptoms being the more severely affected cases. Testing 220 schizophrenics with a symptom rating scale designed by the authors, they found Crow's model best fit their data while Andreasen's model did the poorest. The authors conclude by noting that although Crow's model fit best, positive and negative symptoms are not completely independent, they are positively correlated. This explains why schizophrenics show both

symptom patterns. Guelfi, Faustman and Csernansky (1989) studied 61 unmedicated male schizophrenics and found that positive and negative symptoms did not correlate and the distribution of subjects showed a large percentage with both positive and negative symptoms.

Information processing theories and research abound that discuss different processing tasks in normal, schizophrenic, high risk for schizophrenia, and remitted postpsychotic schizophrenics. Nuechterlein and Dawson (1984) offer a comprehensive review starting with Donald Broadbent's information processing model of three types of selection operations: filtering of salient stimuli, categorizing classes of stimuli, and pigeonholing for more complex discrimination. Broadbent's theory shifted research from a behavioral to a more cognitive base (Neale & Oltmanns, 1980, p.103). In terms of negative and positive symptoms, schizophrenics have been found to differ in digit span distraction and reality monitoring (Harvey, Earle-Boyer & Levinson, 1988; Oltmanns, 1978; Walker & Harvey, 1986), verbal memory (Green & Walker, 1985), and abstract patterns (Frith, 1977).

Earlier, Bleuler (cited in Neale & Oltmanns, p. 160) saw the loosening of association of schizophrenics as a failure of selective attention, a breakdown of control processes, and disturbances of cohesion and reference.

Gordon, Silverstein, and Harrow (1982), in their discussion of associative thinking conclude:

> A classical feature of verbal behavior in schizophrenia concerns the primary symptom of looseness of association of ideas (Bleuler, 1950). Further theoretical formulations that attempt toexplain thought disorder characteristic of schizophrenia have proven to be both diverse and wide-ranging (Broen & Storms, 1967; Cameron, 1944; Chapman, Chapman & Miller, 1964; Mednick, 1958). To varying degrees, many theorists agree that looseness of associations is a major characteristic of the schizophrenic thought disorder, although they emphasize different aspects of the thought deficit. (p. 684)

One theory of the nature of the associative dysfunction in schizophrenia has been proposed by David Shakow (1962, 1977, 1979, 1980) and is referred to as segmental set theory. Segmental set is defined as the degree to which subjects are able to maintain a major task set. The dysfunction in schizophrenics can be seen as a deficit in sustaining the readiness to respond to task (reaction time) and idiosyncratic word associations. According to Shakow, normals have a generalized (major) set which allows them to adjust to a situation objectively and autonomously by ignoring minor or irrelevant stimuli. Segmental set, as observed in schizophrenics, is characterized by major sets

standing in conflict with possible intruding minor sets or an underlying trend to establish minor sets which results in lower performance due to an inability to conceptualize. Schizophrenics are postulated to segmentalize their internal and external environments and thus have only a partial and superficial involvement in the world. Shakow's theory of attentional deficit is founded in Broadbent's (Nuechterlein and Dawson, 1984) original theory of selective attention where a hypothetical filter in the brain prevents information overload.

In a similar vein, Maher (1972) contends that language disturbances in schizophrenia may be understood as consequences of an inability to maintain attentional focusing which affects sensory input processing, i. e. a failure to inhibit associations from intruding into language utterance. Schizophrenics are unable to inhibit external distracting stimuli or internal associations normally excluded due to their irrelevancy (Maher, 1983).

Chapman, Chapman & Miller (1964) concluded that schizophrenics are incapable of inhibiting the dominant meaning of multi-meaning words: They do not weigh simultaneously several meanings for a single word. In their study, Chapman et al. rated double-meaning words (defined as a hypothetical internal event which mediates a person's overt response to a word) and found a predisposition among schizophrenics toward using a particular response

incorrectly in context. Instead of using cues to find an appropriate word, schizophrenic patients utter cues in free-association, as opposed to goal-directed discourse. Chapman and Chapman (cited in Maher, 1983) criticized Shakow's (1962) mental set model and argued that it should be expanded in terms of an ambiguity of word meaning being present in the genesis of schizophrenic utterance (cited in Maher).

Broen and Storms' (1966) theory fits in with Chapman et al. (1964) cited above because they found deficits to occur primarily in situations that elicit multiple associations. Broen and Storms' theory is based on the idea that people diagnosed as schizophrenic have an increased arousal which decreases response strengths. As arousal increases, such as in words with multiple associations, so does the likelihood of weak, random responses.

The aforementioned theories explain the idiosyncratic quality of associations in schizophrenia as defects in the various stages of information processing. Another approach to theorizing looseness of associations stems from research on language and memory. Jenkins' (1974) contextualist approach states:

> Contextualism holds that experience consists of events. Events have a quality as a whole. By quality is meant the total meaning of the event. The quality of the event is the resultant of the interaction of the

> experiencer and the world, that is, the interaction of the organism and the physical relations that provide support for the experience. The relations can be thought of and analyzed into textures. A texture in turn consists of strands lying in a context. (p.786)

Jenkins' article reviews research in the areas of free recall, event recognition, and integrating information. He concludes that experience consists of events which are the result of the interaction between the individual and the world.

Gordon, Silverstein & Harrow (1982) applied the contextualist approach to word association testing of schizophrenia. They hypothesized that a "pathological" response on a continuous word association test may become more meaningful in the context of a sentence created by the subject to explain the purpose of the association. Gordon et al. tested groups of schizophrenic patients and nonschizophrenic patients; good premorbid and poor premorbid schizophrenics; and paranoid and nonparanoid schizophrenics. The results showed that 70 percent of schizophrenic and nonschizophrenic responses that were originally scored as pathological became meaningful associations when placed in the context of a sentence. Good premorbid and paranoid groups scored better in context than did their counterparts. The authors conclude that schizophrenics' associative processes are not impaired; instead, patients experienced

difficulty in editing information in a later intermediate or response selection stage. This speculation relates to Broadbent's "pigeon-holing" stage discussed earlier. Silverstein and Harrow (1982, 1983) have investigated measures of associative response commonality, idiosyncratic responses, and degree of relatedness in relation to reaction time in schizophrenia (1983), and in relation to continuous word association testing (1982).

Straube, Barth and Konig (1979) looked at schizophrenic speech recall to see if schizophrenics use linguistic rules. In their review of the literature, they found that normals recall better with higher contextual consistency and recall meaningless sentences better than word chains. Straube et al. tested schizophrenics (acute and chronic), alcoholics, and normals with sentences that were either meaningful, grammatically correct but meaningless, and meaningless word chains. Schizophrenics appeared to use the same rules of speech and the same semantic and syntactic repertoire as the normal control group.

Lakoff (1972), in a paper discussing language in context, states that in order to predict what is being said, one must "refer to assumptions about the social context of an utterance, as well as to other implicit assumptions made by the participants in a discourse" (p. 907). Willner (cited in Gordon, Silverstein & Harrow, 1982, p. 685) criticized the use of word association tests alone to

measure thought disorder as they do not allow for the contextual structure to be considered. Schwartz (1978) concludes that "substantial evidence supports the fact that single words or randomized sequences of words are treated very differently from words organized into sentences" (p. 251).

Word association tasks have been utilized since the turn of the century (Kent-Rosanoff, 1910) as a means of assessing associational disturbances of thought processes. In their study, Kent and Rosanoff used 100 spoken words given one at a time to each subject. The subject was directed to react by saying the first word that came to mind. One thousand normals, ages eight to over eighty, and 247 people with varying diagnoses of mental illness (108 were diagnosed with dementia praecox) were tested. "The one tendency which appears to be almost universal among normal persons is the tendency to give in response to any stimulus word one or another of a small group of common reactions" (p.14).

Carl Jung (1973) used word association on patients to measure emotional reactions to words and to uncover complexes in patients. Later, research began comparing word associations of various groups to normal controls. Schizophrenics have been found consistently to deviate from the common responses. Moran et al. (1964) found increased idiosyncracy in schizophrenics over four consecutive days.

Namyslowska (1975) found association differences in first time schizophrenics before and after initial medication. Shakow (1980) found fewer common responses and more individual and unusual responses in a test/retest of schizophrenics. Mefferd (1979) found differences in homonyms versus regular words in a test/retest study of schizophrenics.

Griffith, Mednick, Schulsinger and Diderichsen (1980) tested single word and continuous test behaviors in children at high-risk for schizophrenia and found differences in both tasks, concluding that children at high risk for schizophrenia responded with more deviant associations. Harvey, Walker and Wielgus (1986) discussed the findings of the Griffith study in terms of premorbid psychological variables. Fuller and Kates (1969) studied good versus poor premorbid schizophrenics and found no significant differences. Storms (1977) found good premorbid schizophrenics to have more commonality in word association scores than poor premorbid schizophrenics in longitudinal studies. Studies of word association tasks and positive and negative symptoms, to date, have not been reported in the literature.

The second purpose of this study is to explore the relationship between patterns of word association and positive and negative symptoms. Two hypotheses are proposed. First, in a single word association test, the

negative symptoms of schizophrenia will be found to correlate more highly with pathological (idiosyncratic) responses than positive symptoms. Second, when the associations are placed in the context of a sentence created by the subject to explain their associations, responses overall, will be rated less deviant. Negative symptoms will however, remain more idiosyncratic than positive symptoms. Results will be discussed in terms of Jenkins (1974) contextualist model.

Method

Subjects

Fifty inpatients at Eastern State Hospital in Williamsburg, Virginia served as subjects. Subjects were selected, with the assistance of staff psychologists, from various treatment areas of the hospital: admissions/acute care, intermediate/intensive care, continuing rehabilitation, and community preparation. The 36 males and 14 females selected ranged in age from 21 to 63 years (M = 37); had a mean education level of 10 years; and a mean IQ score of 65. IQ score was determined using Hafner, Corotto, and Curnutt's (1978) short form of the Wechsler Adult Intelligence Scale (WAIS) for clinical populations which includes the Similarities, Block Design, and Picture Arrangement subtests. Demographic information on the 50 patients is presented in Table 1. All psychotropic medication was converted to Thorazine equivalents using the conversion tables of Lehman (1975) and Schatzber and Cole (1986).

Care was taken to insure that all subjects met the following criteria: A DSM-III-R Axis I diagnosis of schizophrenia, no changes in medication in the last two weeks (to avoid confusing drug-induced akinesia symptoms) (Lewine, 1985; Van Putten & May, 1978), no evidence of an acute psychotic episode within the previous two weeks which

could have developed into post-psychotic depression (McGlashan & Carpenter, 1976), and no record of organic brain disorder (Harvey et al. 1988). Current secondary diagnoses of substance abuse and mental retardation were also excluded.

Table 1

Demographic Information (N = 50)

	Min	Max	Mean	
Age	21.0	63.0	37.5	
Education (yr)	4.0	15.0	10.1	
Age (first admission)	6.0	43.0	20.4	
Number of hospitalizations	1.0	20.0	7.8	
Present admission (yr)	0.1	22.9	3.7	
All admissions (yr)	0.1	39.5	10.3	
IQ	32.0	108.0	65.2	Meds
(mg/day Thorazine)	0.0	6250.0	1632.5	
Ullman-Giovannoni (1964)				
reactive scale (24 items)	1.0	16.0	6.1	

Instruments

In order to improve classification, the newly published Positive and Negative Syndrome Scale (PANSS) (Kay, Fiszbein

& Opler, 1987) was used to assess symptomatology (see Appendix A). The PANSS includes a 30 to 40 minute semiformalized psychiatric interview that allows direct observation of affective, attentional, perceptual, integrative, motor, cognitive, and interactive functions (see Appendix B). The standardized interview procedure and specific rating criteria of the PANSS make this instrument unique among available positive-negative symptom scales (Kay & Singh, 1989).

The data from the interview, as well as information from the subject's hospital records, were applied, within 24 hours after the testing session, to scoring the PANSS. The PANSS is a 30 item, 7-point rating instrument which gauges the relationship of positive and negative symptoms to each other and to global psychopathology (see Appendix A). Positive symptoms included in the PANSS are: delusions, conceptual disorganization, hallucinatory behavior, excitement, grandiosity, suspiciousness, and hostility. Negative symptoms included in the PANSS are: blunted affect, emotional withdrawal, poor rapport, passive/apathetic social withdrawal, difficulty in abstract thinking, lack of spontaneity and flow of conversation, and stereotyped thinking. Global psychopathology are symptoms that are neither positive nor negative such as disorientation, preoccupation, and poor attention.

Five studies have provided evidence for the validity and predictability of the PANSS (Kay, Fiszbein & Opler, 1987). The mean interrater correlations for the PANSS scales have ranged between .83 and .87 ($p<.0001$). Criterion-related validity between the PANSS and the widely used Scale for the Assessment of Positive Symptoms and Scale for the Assessment of Negative Symptoms (Andreasen, 1984a, 1984b) has been reported to be acceptable ($r = .77$, $p<.0001$) (Kay, Opler & Lindenmayer, 1987). Advantages of the PANSS include: a concise and unified rating system of symptomatology, a manual-type format of instructions, and a standardized interview for consistency.

In order to test the schizophrenic's individuality and idiosyncracy of word associations, a single word association test (WAT) was used. All words came from the Kent-Rosanoff (1910) word lists and response words were rated on commonality based on the Kent-Rosanoff norms. Bettner, Blum, and Jarvik (1982) questioned whether or not the Kent-Rosanoff norms could still be considered an accurate measure of common and idiosyncratic word associations. In their study of twins, they found 90 percent of the common responses in the 1910 norm tables remained common.

In the WAT, subjects heard a stimulus word and were asked to respond verbally with the first word that came to mind. Thirteen stimulus words were used. In a previous study by the author (Johnson, 1990), these stimulus words

demonstrated a high likelihood of generating idiosyncratic responses (see Appendix C). All subjects received the same words in identical order. Stimulus words (presented in order horizontally):

boy	mountain	spider	lamp
sleep	beautiful	window	child
scissors	music	butterfly	earth
quiet			

In order to rate the association of the stimulus-response word pair once it had been put into the context of a sentence by the subject, the Cognitive Dimensions Scale for the Sentence Formulation Test (Gordon, Silverstein & Harrow, 1982) was utilized (see Appendix D). This test was developed by Gordon, Silverstein, and Harrow to measure the degree of relatedness between the word pairs once they were placed in the context of a sentence. The eight categories (broken down into 18 code types) allow the rater to determine if an association is clear, vague, or totally non-meaningful based on various response types. These response types include: well-clarified, mediated, personalized, phonetic, semantically ambiguous, unexplained, elaboration on one word only, and spoiled.

The Cognitive Dimensions Scale for the Sentence Formulation Test (Gordon, Silverstein & Harrow, 1982) was recategorized for this study. The experimenter and an

independent rater, after separately rating all sentences on response type, grouped the 18 response types into five categories (see Appendix E). This was done in an effort to separate associated responses from nonassociated responses within the response types listed above.

Reliability studies of the Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, 1984a), using a kappa coefficient, have indicated a reliability figures ranging from .63 ($p<.001$) to .95 ($p<.0001$), with a mean reliability of .76 ($p<.001$). Although this is a different scale, it was designed to measure the same symptom constellation as the PANSS including: alogia, affective flattening, avolition-apathy, anhedonia-asociality, and attentional impairment.

Previous research by this author (Johnson, 1990), using the PANSS, indicated that interrater reliability of ratings of negative symptoms was somewhat lower than observed for positive symptoms: total negative symptoms correlated .75 ($p<.001$, $N = 8$), total positive symptoms correlated .93 ($p<.0001$), and general psychopathology correlated .57 ($p<.001$).

In order to test the subjects on process/reactive items, the Ullman & Giovannoni (1964) scale was used (see Appendix F). This is a 24-item questionnaire which explores the social history of the patient. Although it is a self-report measure, it was adapted and used by the

experimenter and the rater as a checklist. The questionnaire was completed based on information obtained by the interview and chart history.

As stated above, the short form of the WAIS, developed by Hafner, Corotto, and Curnutt (1978), was used. This short form may result in a somewhat lower score of intellectual functioning than a full-scale WAIS-R. Five subjects had both a WAIS-R and the short form with which to compare. In each case, the short form IQ score was lower (short form $\underline{M}$ = 58; full-scale $\underline{M}$ = 69), with an average difference of 11 points.

Procedure

Patients who met the appropriate diagnostic selection criteria were asked by the experimenter to participate in the study. Staff psychologists assisted with subject selection and served in a supervisory capacity when needed. Patients were informed of the purpose of the study in terms of the experimenter being interested in looking at people who were in the hospital and how they used certain words. Each patient was interviewed and informed about expectations that the experiment would require them to answer questions about themselves, respond to words, and perform simple tasks; and were told that some background information would have to be obtained from their records. It was explained to each patient that all information would be held in confidence and that no one would be able to identify them in

the study nor would their performance on the task in any way effect their treatment in the hospital. Subjects were informed that they could discontinue the study any time they felt uncomfortable. Signed consent (see Appendix G) was obtained and witnessed before testing.

The experimenter was present for all 50 test sessions. Each subject was tested individually by the experimenter or the independent rater who was present for 29 of the 50 interview sessions. At the test site, the subject again received an explanation of the study and was told that s/he was free to stop if the situation became uncomfortable. Each subject was administered the Block Design, Similarities, and Picture Arrangement subtests of the WAIS-R unless one had been administered within the past two years, in which case the subtests were applied to the Hafner, Corotto, and Curnutt (1978) short form.

The single WAT was administered next with the subject being asked to say the first word that came to mind when the stimulus word was presented. Instructions were repeated if the subject got off task. When all 13 stimulus words were presented, the subject was told that the experimenter was interested in why s/he responded with the words s/he did. The subject was asked to put each word pair into a sentence to explain why the words went together. Each word pair was presented in the same order as the WAT and the subject was redirected if s/he got off task. The word and sentence

tests were done before the interview to avoid experimenter bias.

Next, the interview section of the PANSS was administered with all responses being recorded manually by the experimenter, and the rater, when present. The length of testing was 45 min to 1 hr 15 min and all but one subject was tested at one sitting. After testing, the subject was asked if there were any questions or problems. Information about the research project was explained beforehand, therefore no formal debriefing occurred.

Rater 2 mentioned above, present during 29 sessions, participated in all the data collection and chart reviews of the 29 subjects he observed. The second rater's results were used to determine interrater reliability with the experimenter on the PANSS, the Ullman-Giovannoni reactive scale, and the Cognitive Dimensions Scale.

Demographic and history data was obtained from each patient's records. Information obtained included possible confounding variables such as: age, sex (Mayer, Alpert, Stastny, Perlick and Empfield, 1985), race, education, age of first admission, number of hospitalizations, current medications (scaled to Thorazine) (Lehmann, 1975; Schatzberg & Cole, 1986), length of hospitalization (Lewine, 1985; Carpenter, Heinrichs and Alphs, 1985), and intelligence. Each subject's social history and recent clinical notes were reviewed by both raters.

Results

Information from the PANSS interview and chart was applied to the PANSS rating scale and the Ullman & Giovannoni (1964) process/reactive questionnaire within 24 hours of the interview. The ratings were completed by both raters individually and separately. The PANSS employs several different criteria in rating symptomatology and allows for scoring four categories: positive points received, negative points received, a composite score (positive minus negative), and general psychopathology points received.

If one is interested in typing a person as negative or positive, to examine between-group differences, there are several scoring methods. The most lenient score involves subtracting the total negative score from the total positive score so that each person is categorized as negative or positive. The problem with this method is that two negative symptom people, one with a score of -1 and the other with a score of -13, would both be considered in the negative symptom category. The strictest scoring criterion involves categorizing pure negative (with no positive symptoms) or pure positive (with no negative symptoms). Since all subjects presented with scores from both symptom types, this method was not practical.

The criterion used in this study to discuss between-group differences involved categorizing people using only scores on individual items that were greater than three (on a 7-point scale). With this criterion, positive symptoms require that three or more positive items greater than three are present with less than three negative items greater than three. Using this method, people can be placed in positive, negative, mixed, or neither categories, with more polarity between the symptom types. Demographic information on the two groups, classified by this method, can be found in Table 2.

Kay and Opler (1987) have noted "the limitations imposed by a typological framework" (p. 87) and have suggested that researchers adopt a dimensional approach as well. Scoring of continuous scales for assessing syndromes is accomplished as follows: a positive syndrome score is calculated as the sum of the seven positive symptoms and a negative syndrome score as the sum of negative symptoms. Using this method, correlations can be obtained between symptom dimensions and subjects' scores on non-symptom measures.

Before the analysis of interrater reliability was performed, the scored protocols (N = 29) completed by both raters, were reviewed and two were eliminated. One was removed because the experimenter rated the patient on the basis of her knowledge of present symptomatology while the

second rater used past history to determine present behaviors due to limited information about current status. The second protocol was eliminated due to second rater

Table 2

Demographic Information by Positive and Negative Symptomatology

(N = 20)

	Symptom Type	
Mean	Negative	Positive
Total number of subjects	9	11
Age	33.3	38.3
Education (yr)	10.6	10.4
Age (first admission)	23.1	21.0
Number of hospitalizations	6.6	10.6
Present admission (yr)	3.2	2.5
Total admissions (yr)	5.7	8.6
IQ	66.7	71.3
Meds (mg/day Thorazine)	1055.7	2038.1
Ullman-Giovannoni scores	6.8	6.7

reacting strongly to a particular subject which interfered with rating the patient in an unbiased manner.

The interrater reliability of the PANSS on the 27 subjects rated was determined. Pearson correlation coefficients were calculated (see Appendix H) and positive symptom items ranged from r = .83 (p<.001, N = 27) for hallucinatory behavior to r = .54 (p<.001) for suspiciousness/persecution. The overall positive syndrome ratings correlated r = .87 (p<.001). Negative symptom items ranged from r = .65 (p<.001) for difficulty in abstract thinking to r = .007 for stereotyped thinking. The overall negative syndrome correlated r = .59 (p<.001). General psychopathology items ranged from r = .85 (p<.001) for disorientation to r = .164 for anxiety. The overall global psychopathology correlated r = .82 (p<.001). Table 3 compares Kay and Opler's (1987) reliability findings with those obtained in this study.

It should be noted that positive and general psychopathology ratings are in line with Kay and Opler's findings. The correlation of ratings of negative symptoms are somewhat lower in this study. One reason could be the restricted range within which the data was analyzed. Items are rated on a scale of one to seven, however in most cases, only the middle two or three numbers were used in scoring, restricting the range of analysis.

Descriptive data was obtained to determine the percentage of agreement between the two raters based on a cumulative frequency of the raters being within one point of each other on a given item rating. Percentages, within a one-point error range, were as follows: positive symptoms ranged from 96% to 63% concordance; negative symptoms ranged from 89% to 67%; and general psychopathology ranged from 100% to 70% (see Appendix H). Table 3 compares Kay and Opler's (1987) findings with this study. As can be seen, Table 3 rater percentages are comparable. Using percentage agreement according to the above criterion, for example, the Pearson $\underline{r}$ = .007 for stereotyped thinking actually had a 89% agreement rate. It should be noted that negative symptoms contain more ratings of cognitive function and are more inferential in nature, thus making them more difficult to rate reliably. It could be possible that the second rater, less familiar with the scale, was not consistent in his rating, but it was not statistically possible to test each rater's individual consistency with only two raters.

Using a Pearson coefficient correlation, the positive syndrome was not significantly correlated with the negative syndrome ($\underline{r}$ = -.17, $\underline{N}$ = 50), suggesting a weak independence between the two syndromes. Positive symptoms correlated somewhat more with ratings of general psychopathology on the PANSS ($\underline{r}$ = .59, $\underline{p}$<.001) than negative symptoms ($\underline{r}$ = .30, $\underline{p}$<.05). This evidence suggests that the global severity of

Table 3

PANSS Interrater Reliability

	Symptom Type		
	Positive	Negative	General
Kay & Opler (1987) Study (N = 31)			
Item range*	73 to 89	70 to 89	69 to 94
Mean (% agreement)*	79	78	83
Pearson r	81	84	88
P	<.0001	<.0001	<.0001
This study (N = 27)			
Item range*	63 to 96	67 to 89	70 to 100
Mean (% agreement)*	86	78	88
Pearson r	87	59	82
P	<.0001	<.001	<.0001

*percent agreement within a one-point error range

illness may contribute to both negative and positive ratings and will therefore be used as a covariate. Two other covariates were included in data analysis: medication level (mg/day Thorazine) correlated positively with positive symptoms (r = .50, p<.001) and IQ correlated negatively with both positive (r = -.35, p<.01) and negative (r = -.36, p<.01) symptoms.

Scoring of the word association test followed Kent-Rosanoff's (1910) norms. All word responses were removed from the protocols and scored after all data was collected to avoid biasing symptom knowledge with response type. A common score was recorded if the response word appeared in the listing for the appropriate stimulus word. An individual response was recorded if a response word was not found in the common listing. As hypothesized, negative symptoms produced significantly fewer common responses (r = -.39, p<.01, N = 50) and more individual responses (r = .39, p<.01). Results with the effects of medication, IQ, and general psychopathology partialled out show the same general trend, as Table 4 illustrates.

Positive symptoms did not significantly correlate with either association response type. A correlation with covariations of medication, IQ, and general psychopathology approached significance for positive symptoms (r = .25 for common responses; r = -.25 for individual responses) (see Table 4).

Table 4

Word Association Testing by Symptom Type (N = 50)

	Response Type	
Negative Symptoms	Common	Individual
Pearson Correlation	-.390*	.390*
Part Corr (med effects)	-.412*	.412*
Part Corr (IQ effects)	-.313***	.313***
Part Corr (psypath effects)	-.371*	.371*
Part Corr (med, IQ, psy)	-.345**	.345**
Positive Symptoms		
Pearson Correlation	.056	-.056
Part Corr (med effects)	.133	-.133
Part Corr (IQ effects)	.184	-.184
Part Corr (psypath effects)	.168	-.168
Part Corr (med, IQ, psy)	.254	-.254

* p<.01 ** p<.02 ***p<.05

A 2 x 2 analysis of variance indicated between-group differences between the predominantly positive syndrome patients (N = 11) and predominantly negative syndrome patients (N = 9) categorized using the criteria stated above. Common responses differed between positive symptom (M = 11.3) and negative symptom (M = 7.7) groups. Individual responses differed between positive symptoms (M = 1.7) and negative symptoms (M = 5.3) as well. The analysis of variance indicated significant differences between both groups for each response type, $F(1,18) = 6.16$, $p<.02$. Covariation of medication, IQ, and general psychopathology scores did not influence significance levels.

The 50 sets of 13 sentences were rated independently by the experimenter and the second rater after all data was collected. The 18 categories of the Cognitive Dimensions Scale for the Sentence Formulation Test (Gordon, Silverstein & Harrow, 1982) were recategorized by the two raters into five categories: two related sentence types and three non-related sentence types (see Appendix D). Pearson chi-square and likelihood ratio chi-square analyses of the interrater reliability of all thirteen sentences was high ($p<.0001$), therefore the experimenter's ratings alone were used in future analyses.

Negative and positive symptoms both correlated negatively with sentence relatedness (r = -.36, $p<.01$,

N = 50 and r = -.33, p<.02, respectively) and positively with sentence non-relatedness (r = .36, p<.01 and r = .33, p<.02, respectively) (see Table 5).

Table 5

Relatedness of Sentences by Symptom Type (N = 50)

	Sentence Relatedness	
Negative Symptoms	Associated	Nonassociated
Pearson Correlation	-.356*	.356*
Partial out medication	-.384*	.384*
Partial out IQ	-.224	.224
Partial out psypath	-.270	.270
Partial out med,IQ,psypath	-.203	.203
Positive Symptoms		
Pearson Correlation	-.333**	.333**
Partial out medication	-.300***	.300***
Partial out IQ	-.204	.204
Partial out psypath	-.270	.270
Partial out med,IQ,psypath	-.105	.105

* p<.01 ** p<.02 *** p<.05

Partialling out the effects medication strengthened the correlation between the negative symptoms and relatedness ratings somewhat, while covariation of general psychopathology and IQ decreased the correlations (see Table 5).

There were no between-group differences observed, in fact, the mean number of related sentences for positive and negative symptom types respectively was 8.4 and 8.3. For non-related sentences, the mean number was 4.6 for positive syndrome type and 4.7 for negative syndrome type.

It was hypothesized that all individual word association responses would become less deviant when placed in the context of a sentence, but that this would be less so for negative symptomatology. Each word response and corresponding sentence was categorized into one of four types: common response/related sentence (C/R); common response/unrelated sentence (C/U); individual response/related sentence (I/R); individual response/unrelated sentence (I/U). C/R represents a common response that remains associated in the context of a sentence. C/U is a common response that the person can not explain in an associated sentence. I/R represents an individual response that is found to be associated once a sentence is employed to explain it. I/U is an individual response that remains idiosyncratic and unrelated in the context of a sentence. Mean responses to each category for

patients evidencing mostly positive or negative symptoms are presented in Figure 1.

Insert Figure 1 about here

Table 6 presents Pearson correlations between negative and positive symptomatology, as well as general psychopathology, and the four categories discussed above.

Table 6

Pearson Correlations of PANSS Ratings and Word/Sentence Categories (N = 50)

	PANSS Rating		
Word/Sentence Type	Negative	Positive	General
Common/Related	-.40**	-.22	-.35***
Common/Unrelated	.09	.35***	.32***
Individual/Related	.05	-.24	-.13
Individual/Unrelated	.48*	.13	.29****

p<.001 ** p<.01 *** p<.02 **** p<.05

Negative symptomatology correlated negatively with C/R responses (r = -.40, p<.01, N = 50), showing that patients evidencing a preponderance of negative symptoms could not make common responses that were also explained in a sentence. Negative symptoms also correlated with I/U responses (r = .48, p<.001), indicating that as negative symptoms increase, so does the inability to explain individual associations in a sentence. These two findings are consistent with findings reported earlier that negative symptoms correlate with individual responses and inversely with common responses.

Surprisingly, positive symptoms correlated with C/U (r = .35, p<.01), indicating that as positive symptomatology increases, so does the frequency of common responses that the subjects can not explain in a sentence. Partialling out medications, IQ, and general psychopathology did not affect the overall correlational trends.

Between-group means and percentages of the original common and individual responses and how the responses changed in the context of a sentence are presented on Table 7. Of the 143 responses to the word association task produced by the positive syndrome group (N = 11), 124 (87%) were common responses and 19 (13%) were individual. For the negative syndrome group, 117 responses were produced with 69 (59%) being common responses and 48 (41%) being individual. Table 7 indicates that positive syndrome patients were not

Table 7

Word/Sentence Responses in Negative and Positive Syndrome Types

(Positive N = 11, Negative N = 9)

	Positive		Negative	
Responses	M	%	M	%
Common (WAT)	11.3	87	7.7	59
C/R	7.3	65	5.6	73
C/U	4.0	35	2.1	27
Individual (WAT)	1.7	13	5.3	41
I/R	1.1	65	2.8	53
I/U	.6	35	2.5	47

z scores between response types significant at p<.0001

able to explain 35% (z = 8.18, p<.0001) of their common responses when given the opportunity to do so in a sentence while negative syndrome patients were not able to explain 27% (z = 5.06, p<.0001) of their common responses in the

context of a sentence. Figure 2 presents these relationships.

Insert Figure 2 about here

The contextual hypothesis was supported in that groups exhibiting predominantly positive symptoms and predominantly negative symptoms both benefited from explaining individual responses in a sentence due to the underlying idiosyncratic association being explained. This effect was expected to be higher in positive syndrome patients. Of the 19 idiosyncratic word responses of positive syndrome patients, 12 (65%) became associated in the context of a sentence. Of the 48 idiosyncratic word responses of negative syndrome patients, 25 (53%) became associated in the context of a sentence. These differences are significant for positive (z = 5.94, p<.0001) and negative (z = 7.36, p<.0001) syndrome types.

Differences between the means of the two syndrome groups were not significant for individual responses that became associated in context (z = .13, p<.45) (I/R). This was due to the fact that there were so few positive syndrome response words that were idiosyncratic in nature (19 words). Using a greater number of stimulus response words would strengthen between-group differences.

The interrater reliability of the Ullman-Giovannoni (1964) 24-item reactive scale was found to be .76 ($p<.001$, $N = 27$). The reactive scale correlated inversely with negative symptoms ($r = -.291$, $p<.05$, $N=50$) but did not significantly correlate with positive symptoms ($r = .057$). Since reactive schizophrenia is likened to positive symptomatology, the inverse correlation with negative symptoms is understandable. The Ullman-Giovannoni reactive scale also correlated with years of education ($r = .324$, $p<.02$, $N = 50$), age of first admission ($r = .515$, $p<.001$), and IQ ($r = .354$, $p<.01$).

The Ullman-Giovannoni (1964) reactive scale did not correlate significantly with the word association task in common responses ($r = .08$, $N = 50$) or individual responses ($r = -.08$). This scale of reactive social history did not correlate with related sentences ($r = .17$) or non-related sentences ($r = -.16$). No significant correlations were found when common and individual sentences were categorized with related and non-related sentences: C/R correlated .16; C/U correlated -.13; I/R correlated .02; and I/U correlated -.12). In summary, the Ullman-Giovannoni, which measures premorbid functioning and social history, was not found to be related to word association response differences.

Discussion

The PANSS (Kay, Fiszbein & Opler, 1987) appears to be a concise, unified scale to measure the dimensions of positive and negative symptomatology of schizophrenia. One strength of the PANSS is that its rating manual format provides specific guidelines for conduct of the rating interview, including specific sets of questions for eliciting various areas in psychopathology. Each item includes a precise definition, stipulations of the basis of rating, and detailed criteria for rating levels. These guidelines may not be specific enough, however, for rating negative symptomatology.

One possible explanation for the lower interrater reliability of negative symptoms, using the PANSS observed in this study, may have resulted from the fact that one rater (the author) had more experience with the scale, and was acquainted with most of the rated patients beforehand. This rater was undoubtedly influenced by past contacts, especially in her ratings of the more cognitive constructs associated with the PANSS item measures of negative symptomatology. PANSS negative symptom items require more ratings of aspects of cognitive functioning, and are therefore more inferential. Thus, the more familiar the rater is with the patient, the broader the context used and possibly the more accurately negative symptoms can be

assessed. For example, ratings of negative symptoms include items such as: the presence of stereotyped thinking, emotional withdrawal, and poor rapport. These symptoms can, upon rating, be attributed to situational factors such as medication or interview anxiety, as well as trait-like characteristics. Positive symptoms, on the other hand, are more clearly behavioral, e. g. hallucinations, delusions, and grandiosity. In spite of these differences in level of inference required for ratings of positive and negative symptoms, the PANSS has many strengths that make it a concise and useful instrument for rating schizophrenic symptomatology.

This study was designed to explore the word association patterns of schizophrenics exhibiting negative and positive symptoms as determined by PANSS criteria. As hypothesized, as negative symptoms increased, the number of common word association responses decreased ($r = -.39$, $p<.01$, $N = 50$), and as negative symptoms increased, individual word responses increased ($r = .39$, $p<.01$). Correlations between positive symptoms and word associations were not significant; however, significant group differences between predominantly positive and predominantly negative patients were found. Positive syndrome patients gave more common responses, and negative syndrome patients had more individual responses ($p<.02$) on the word association task.

These findings are consistent with a previous study by this author (Johnson, 1990) using the same 13 stimulus words. In that study, negative symptoms were found to correlate inversely with common responses (r = -.55, p<.01, N = 30) and correlate in a positive direction with individual responses (r = .55, p<.01). Positive symptoms did not correlate significantly with word associations.

These findings suggest that as negative symptoms increase, greater deterioration of cognitive and social function is evident in thought and language. Negative symptoms are characterized by behavioral deterioration (Crow, 1985), a poorer premorbid status, are considered to be chronic and irreversible, and are inversely correlated with IQ (Zubin, 1985). Consistent with previous research, this study also found an inverse correlation with IQ (r = -.36, p<.01, N =50). Negative symptoms are viewed as resistant to the therapeutic effects of neuroleptics (Sommers, 1985). Negative symptoms appear to be more likely associated with ratings of process schizophrenia (poor premorbid status) and positive symptoms with reactive symptoms (good premorbid adjustment). The Ullman-Giovannoni (1964), a scale for rating premorbid adjustment, was found to correlate inversely with negative symptoms (r = -.29, p<.05, N = 50), i. e., the better the premorbid adjustment, the fewer negative symptoms rated.

Negative symptoms of schizophrenia and patients exhibiting a predominant negative syndrome appear, to a large extent, to deviate significantly from the meaning systems used by non-schizophrenics. It would be interesting to change the neutral stimulus word list used in this study to one where fewer words that lend themselves to the association of clear opposites are presented. The stimulus words boy, sleep, beautiful, and quiet, for example, tend to give more rote responses of opposites. Consonant with this observation, Willerman and Cohen (1990) have noted:

> Tests of simple verbal association show that schizophrenics deviate from normals in two diametrically opposite ways: either they choose rare and idiosyncratic associations or they choose common but inappropriate associations. Although schizophrenics can produce conventional associates (up: "down", light: "dark", for example), they often use infrequent ones (up: "there", light: "weight"). Many studies have found schizophrenics to be idiosyncratic in simple verbal association tasks, but this behavior is highly variable and situation-dependent. (p. 303)

Perhaps, presentations of more emotionally-laden words could affect association responses, especially in the case of positive symptoms where "florid" psychosis is more likely present. Positive symptoms do not appear to disclose much about social history for in this study they did not

correlate significantly with the Ullman-Giovannoni (1964) reactive scale. Positive symptoms are thought to be associated with an acute onset, a more normal pre- and postmorbid status, higher cognitive functioning, and a better response to neuroleptics. Perhaps positive symptoms did not correlate with common or individual responses because ratings of these symptoms focus on the presence of delusions and hallucinations, rather than the absence of normal, cognitive functioning.

Both positive and negative syndrome patients, on average, were able to explain their word pairs in a related fashion in 8 of their 13 sentences, while 5 of the 13 were unrelated. Negative syndrome schizophrenics evidenced more examples of not being able to use one or both words of the word pair, but this was not a significant difference from positive syndrome patients. Negative and positive symptoms both correlated significantly with related and unrelated sentences. This data supports the finding that both syndrome types are equally capable of making related and unrelated sentences.

Research on associative thought disorder of schizophrenia appears to be shifting to a more contextual approach; stemming from research on language and memory. Jenkins (1974), for example, has emphasized the importance of viewing relationships (associations) as lying within a context. A contextualist approach to word association would

predict that many idiosyncratic responses would become meaningful if placed in the context of a sentence. This second hypothesis, derived from the contextualist position of this study, was supported: When the stimulus/response pairs are placed in the context of a sentence, their responses were rated as less deviant; with negative symptoms remaining more idiosyncratic than positive symptoms. Review of Table 7 reveals indicates these findings. Patients exhibiting predominantly positive symptoms responded with a common word response 87% of the time. However, 35% of these common responses could not be explained in a related sentence. This could be due in part to Willerman and Cohen's (1990) belief that schizophrenics often produce conventional associates that they may not comprehend. In contrast, predominantly negative syndrome patients gave 59% common word responses and were able to explain these common responses in the context of a sentence 73% of the time.

Presenting the above data in another way, predominantly positive syndrome schizophrenics responded idiosyncratically 13% of the time in a WAT while negative syndrome schizophrenics responded idiosyncratically 41% of the time. When given the opportunity to explain the association, 65% of the positive syndrome patients' individual responses became related while they were unable to explain the relation 35% of the time. With negative syndrome patients', 53% of their individual responses became related in the

context of a sentence while 47% remained unrelated. These findings call into question the frequency and interpretation of purported underlying associative disturbances in schizophrenia.

The associative context hypothesis include in this study was based largely on the research of Gordon, Silverstein, and Harrow (1982) who studied schizophrenics' and nonschizophrenics' word responses in the context of a sentence. Gordon et al. found that 70% of the word responses of schizophrenics were made meaningful in the context of a sentence "and did not appear to effect gross evidence of an associative thought disorder" (p.689). This trend was found in good premorbid (68%) and poor premorbid (72%) schizophrenics, as well as in paranoid (77%) and nonparanoid (61%) schizophrenics.

The present study found that 50% of the word responses of good premorbid schizophrenics (Ullman-Giovannoni reactive score of 5 or less, $\underline{N}$ = 27) and 56% of the word responses of poor premorbid schizophrenics (reactive score of 6 or more, $\underline{N}$ = 23) were made meaningful in the context of a sentence. This trend was found in paranoid (59%, $\underline{N}$ = 21) and nonparanoid (46%, $\underline{N}$ = 29) schizophrenics as well.

Gordon, Silverstein, and Harrow (1982) see the deviant word association of schizophrenics as the result of a difficulty in editing idiosyncratic verbalizations: perhaps along the lines of Schwartz's (1978) hypothesis of an

impairment at an intermediate stage of information-processing.

The present study demonstrates, both experimentally and theoretically, that a contextualist approach to the associative thought disorder of schizophrenia should be considered. Associative deficits in schizophrenia should be understood as part of a broad perspective rather than in isolated segments. Word association tests alone do not reflect the overall processes of association or thought disorder in schizophrenia. Both positive and negative schizophrenics can explain their idiosyncratic associations relevantly: positive symptom patients performing better on the task. This finding supports an overall cognitive difference between positive and negative symptom patterns.

There is a need in all areas of schizophrenia research to use a uniform and consistent symptom classification "to improve reliability of communication between scientists and professionals by providing empirically derived summaries of behavioral signs" (Shean, 1987, p.48). Dimensions of symptom classification are useful ways to supplement clinical diagnosis in order to better organize data, for the current DSM-III-R diagnosis of schizophrenia is too broad a category to be useful for research purposes.

This study contributes to the growing body of evidence which suggests that schizophrenia may consist of different

dimensions of symptom types requiring different theoretical explanations and treatments.

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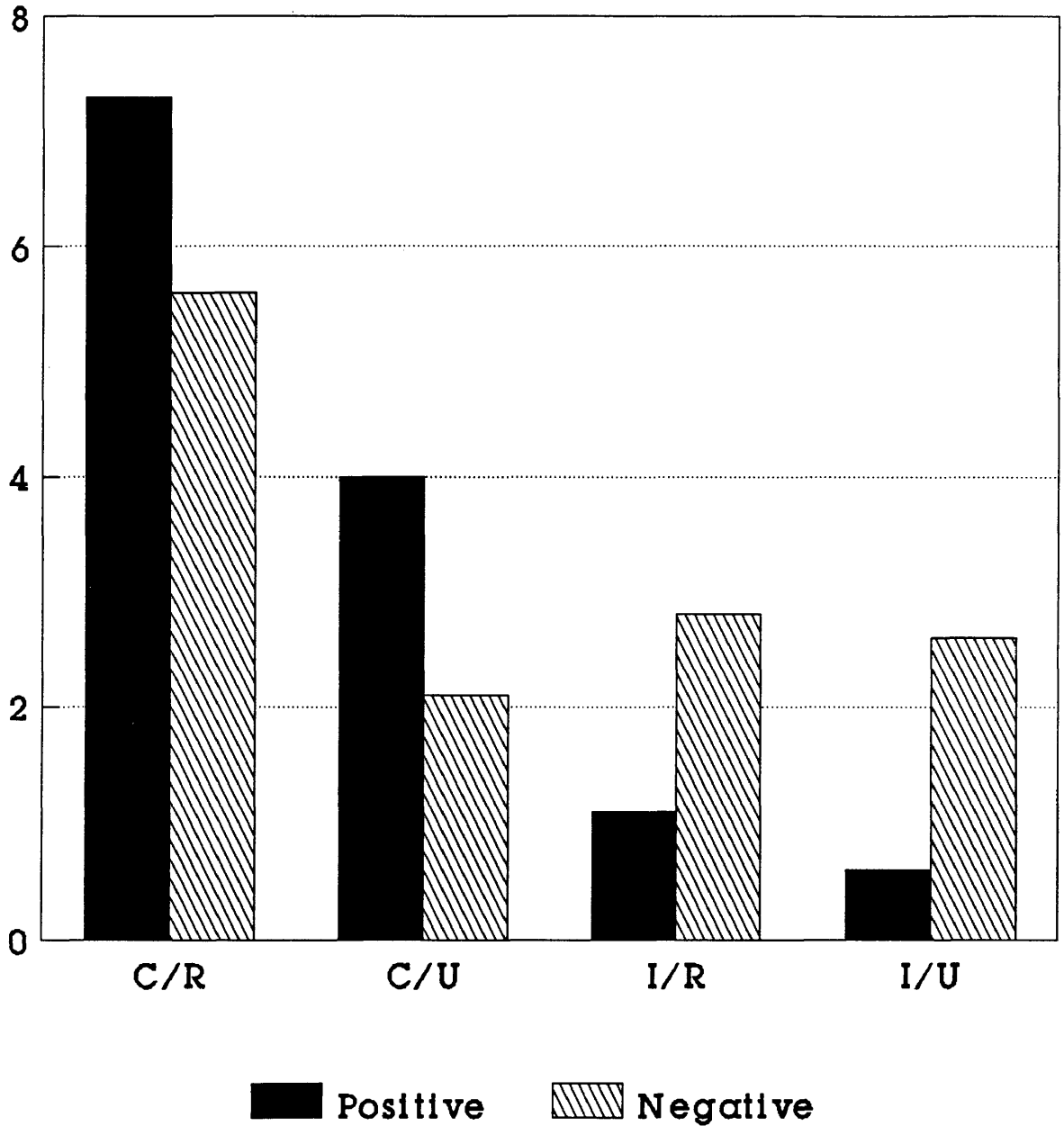
Figure 1.

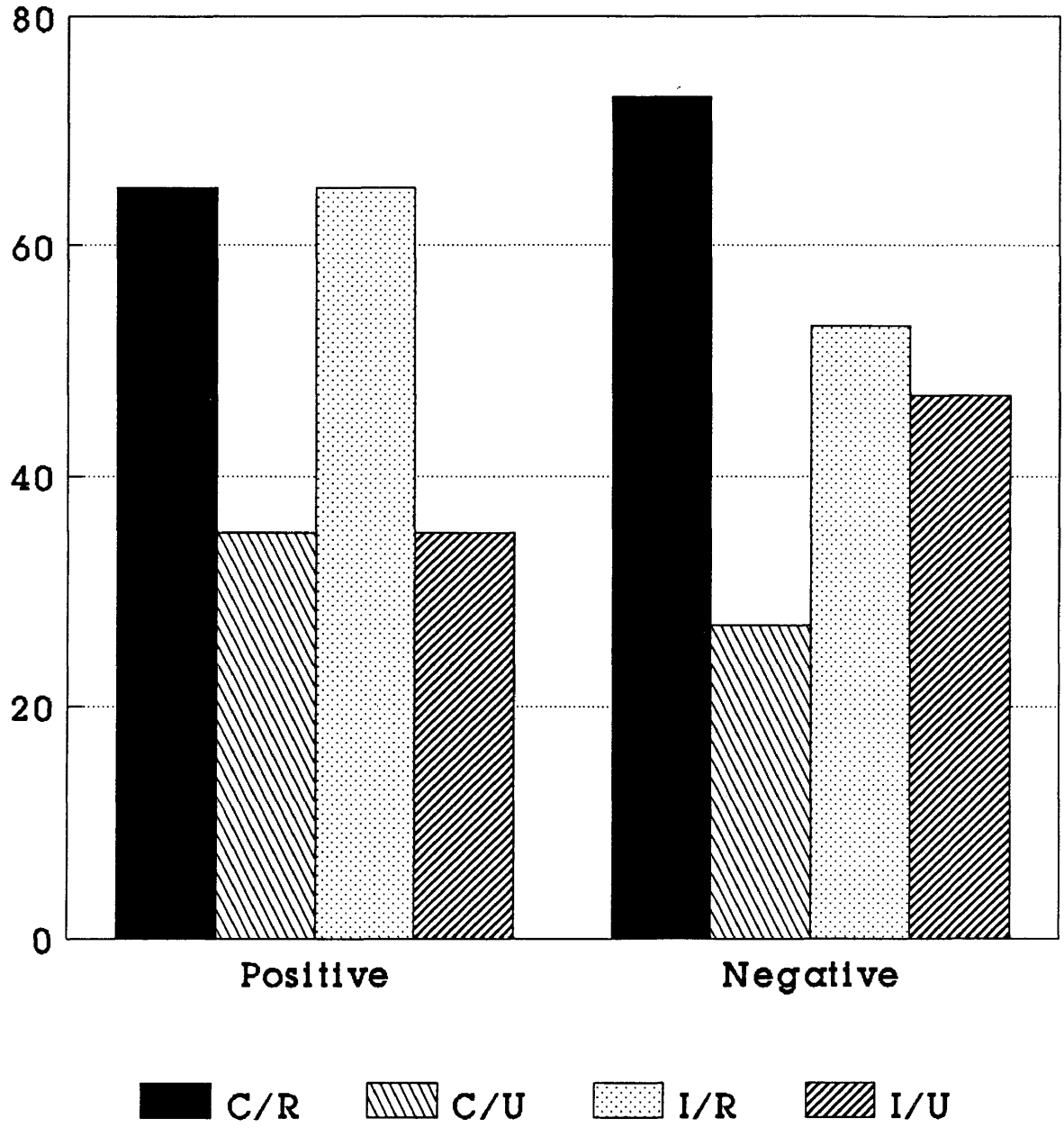
MEAN RESPONSE RATES
by symptom type



t-test sign. at p<.05

Figure 2.

WORD/SENTENCE %
by symptom type



z-test/categories,p(.001

APPENDIX A

PANSS RATING CRITERIA

Positive Scale (P)

P1. Delusions. Beliefs which are unfounded, unrealistic, and idiosyncratic. Basis for rating: thought content expressed in the interview and its influence on social relations and behavior.

1. Absent - Definition does not apply.

2. Minimal - Questionable pathology; may be at the upper extreme of normal limits.

3. Mild - Presence of one or two delusions which are vague, uncrystallized, and not tenaciously held. Delusions do not interfere with thinking, social relations, or behavior.

4. Moderate - Presence of either a kaleidoscopic array of poorly formed, unstable delusions or of a few well-formed delusions that occasionally interfere with thinking, social relations, or behavior.

5. Moderate severe - Presence of numerous well-formed delusions that are tenaciously held and occasionally interfere with thinking, social relations, or behavior.

6. Severe - Presence of a stable set of delusions which are crystallized, possibly systematized, tenaciously held, and clearly interfere with thinking, social relations, and behavior.

7. Extreme - Presence of a stable set of delusions which are either highly systematized or very numerous, and which dominate major facets of the patient's life. This frequently results in inappropriate and irresponsible action, which may even jeopardize the safety of the patient or others.

APPENDIX A

PANSS RATING CRITERIA

Negative Scale (N)

N1. Blunted affect. Diminished emotional responsiveness as characterized by a reduction in facial expression, modulation of feelings, and communicative gestures. Basis for rating: observation of physical manifestations of affective tone and emotional responsiveness during the course of interview.

1. Absent - Definition does not apply.

2. Minimal - Questionable pathology; may be at the upper extreme of normal limits.

3. Mild - Changes in facial expression and communicative gestures seem to be stilted, forced, artificial, or lacking in modulation.

4. Moderate - Reduced range of facial expression and few expressive gestures result in a dull appearance.

5. Moderate severe - Affect is generally "flat," with only occasional changes in facial expression and a paucity of communicative gestures.

6. Severe - Marked flatness and deficiency of emotions exhibited most of the time. There may be unmodulated extreme affective discharges, such as excitement, rage, or inappropriate uncontrolled laughter.

7. Extreme - Changes in facial expression and evidence of communicative gestures are virtually absent. Patient seems constantly to show a barren or "wooden" expression.

APPENDIX A

PANSS RATING CRITERIA

General Psychopathology Scale (G)

G1. Somatic concern. Physical complaints or beliefs about bodily illness or malfunctions. This may range from a vague sense of ill being to clear-cut delusions of catastrophic physical disease. Basis for rating: thought content expressed in the interview.

1. Absent - Definition does not apply.

2. Minimal - Questionable pathology; may be at the upper extreme of normal limits.

3. Mild - Distinctly concerned about health or somatic issues, as evidenced by occasional questions and desire for reassurance.

4. Moderate - Complains about poor health or bodily malfunction, but there is no delusional conviction, and overconcern can be allayed by reassurance.

5. Moderate severe - Patient expresses numerous or frequent complaints about physical illness or bodily malfunction, or else patient reveals one or two clear-cut delusions involving these themes but is not preoccupied by them.

6. Severe - Patient is preoccupied by one or a few clear-cut delusions about physical disease or organic malfunction, but affect is not fully immersed in these themes, and thoughts can be diverted by the interviewer with some effort.

7. Extreme - Numerous and frequently reported somatic delusions, or only a few somatic delusions of a catastrophic nature, which totally dominate the patient's affect and thinking.

PANSS Rating Manual

APPENDIX A

Positive and Negative Syndrome Scale (PANSS) - Rating Form

Stanley R. Kay, Ph.D.
Lewis A. Opler, M.D., Ph.D.
Abraham Fiszbein, M.D.

Patient's Name_____ Rater_____

Observation Period_____ Date_____

Instructions: Circle the appropriate rating for each dimension following the specified clinical interview. Refer to the Rating Manual for item definitions, description of anchoring points, and scoring procedure.

	ABS	MIN	MILD	MOD	MOD SEV	SEV	EXT
POSITIVE SCALE							
P1. Delusions	1	2	3	4	5	6	7
P2. Conceptual disorganization	1	2	3	4	5	6	7
P3. Hallucinatory behavior	1	2	3	4	5	6	7
P4. Excitement	1	2	3	4	5	6	7
P5. Grandiosity	1	2	3	4	5	6	7
P6. Suspiciousness/persecution	1	2	3	4	5	6	7
P7. Hostility	1	2	3	4	5	6	7
NEGATIVE SCALE							
N1. Blunted affect	1	2	3	4	5	6	7
N2. Emotional withdrawal	1	2	3	4	5	6	7
N3. Poor rapport	1	2	3	4	5	6	7
N4. Passive/apathetic social withdrawal	1	2	3	4	5	6	7

(continued)

PANSS Rating Manual

Appendix A (continued) - PANSS Rating Form

	ABS	MIN	MILD	MOD	MOD SEV	SEV	EXT
N5. Difficulty in abstract thinking	1	2	3	4	5	6	7
N6. Lack of spontaneity and flow of conversation	1	2	3	4	5	6	7
N7. Stereotyped thinking	1	2	3	4	5	6	7
GENERAL PSYCHOPATHOLOGY SCALE							
G1. Somatic concern	1	2	3	4	5	6	7
G2. Anxiety	1	2	3	4	5	6	7
G3. Guilt feelings	1	2	3	4	5	6	7
G4. Tension	1	2	3	4	5	6	7
G5. Mannerisms and posturing	1	2	3	4	5	6	7
G6. Depression	1	2	3	4	5	6	7
G7. Motor retardation	1	2	3	4	5	6	7
G8. Uncooperativeness	1	2	3	4	5	6	7
G9. Unusual thought content	1	2	3	4	5	6	7
G10. Disorientation	1	2	3	4	5	6	7
G11. Poor attention	1	2	3	4	5	6	7
G12. Lack of judgment and insight	1	2	3	4	5	6	7
G13. Disturbance of volition	1	2	3	4	5	6	7
G14. Poor impulse control	1	2	3	4	5	6	7
G15. Preoccupation	1	2	3	4	5	6	7
G16. Active social avoidance	1	2	3	4	5	6	7

(continued)

PANSS Rating Manual

Appendix A (continued) - PANSS Rating Form

Scale	Total	Percentile	Range
Positive			
Negative			
Composite			
General Psychopathology			

Number of Positive Scale symptoms rated > 3 _____

Number of Negative Scale symptoms rated > 3 _____

Syndromal classification _____

APPENDIX B

Prototypic Questions for the PANSS Interview in Pursuing Major Areas of Psychopathology

1) Judgment and insight

What brought you to the hospital (clinic, etc.)?

Are you in need of treatment? Medicine? Hospitalization?

Is your hospitalization a mistake? A punishment? Part of a scheme or plot?

Do you have a psychiatric disorder? Have you had one in the past?

What are the symptoms of your illness?

(If receiving chemotherapy:) Why are you taking medicine?

Are you ready to be discharged from the hospital (clinic, etc.)?

What are your immediate plans? Your plans for the future?

2) Hallucinations

Do you ever have strange experiences? Hear strange noises?

Do you sometimes hear things that others don't hear?

Do you sometimes receive personal communications from the radio or television? From God?

Can you sometimes hear your thoughts aloud inside your head? Do they sound like voices?

Do you sometimes hear voices inside your head? When? How often? How clear are they? How loud are they?

Whose voices do you hear inside your head? How many are there? Do they speak to you, comment about you, or speak to each other?

What do the voices say? Are they good or bad voices? Are you afraid of them?

(continued)

PANSS Rating Manual

Appendix B (continued) - Hallucinations

Do the voices tell you what to do? Give you direct orders?

Do you obey the voices' commands? Must you?

Do ordinary things ever appear strange or distorted?

Do you ever have "visions" or see things that others don't? How often? How clear are these visions?

Do the visions occur together with the voices or separately?

Do you ever smell things that others don't?

Do you get strange sensations from within your body or feel something strange inside you?

What do you make of these voices (visions, etc.)? How did they come about? Are they a problem for you?

3) Delusions (general)

When you are by yourself, what do you think about?

What are your convictions or beliefs about life?

Do you have a particular philosophy that you follow?

4) Ideas of suspicion and persecution

How do you get along with others?

Do you like people? Dislike people? Are you annoyed with people? Afraid of people? Why?

Do you prefer to be alone? Why?

Do people like you? Dislike you? Why?

Do you trust most people that you know? Are there some whom you distrust? Who? Why?

Do people sometimes talk about you behind your back? What do they say? Why?

(continued)

Appendix B (continued) - Ideas of suspicion and persecution

Do some people harbor ill will toward you? Spy on you? Plot against you? Attempt to harm you? Attempt to kill you?

What is the evidence of this? Who is behind all this? Why does this happen?

5) Grandiosity

How do you compare to the average person? Better or worse?

Are you special in some ways?

Do you have talents or abilities that most people don't have?

Do you have ESP? Can you read another person's mind?

Do you have special or unusual powers?

Do you consider yourself wealthy? Famous? Have you ever appeared on television, radio, movies, or stage? Made records?

Do you rate higher than others in terms of your moral standards? Does this make you special in some respect?

Do you have a special mission in life? How did this come about?

Are you a religious person? What is your relationship with God? Are you closer to God than others are? Are you one of God's angels (children, emissaries, etc.)?

6) Guilt feelings

Do you feel less worthwhile than the average person?

Do you consider yourself a bad person in some ways?

Do you feel guilty about something you may have done in the past?

Have you done something to deserve punishment? What kind of punishment do you deserve?

(continued)

Appendix B (continued) - Guilt feelings

Is your present situation (hospitalization, illness, etc.) some kind of punishment? How do you know this?

Have you had thoughts of harming yourself as one kind of punishment? Have you ever acted on those thoughts?

7) Somatic concern

How have you been feeling?

Is there any problem with your physical health? With the way your body has been functioning?

Do you have some medical illness or disease? If so, how serious is it?

How is your head? How is your heart?

Any trouble with your lungs? Arms? Legs? With any other part of your body?

Does your head or body ever feel strange?

Has your head or body changed in shape or size?

What is causing these problems?

8) Depression

What is your typical mood like?

Are you mostly happy? Sad? Why?

How unhappy have you been feeling?

When do you feel the saddest? How long do these feelings last?

Do you sometimes cry? How often?

Has your mood affected your appetite? Your sleep? Your ability to work?

Have you had any thoughts of harming yourself or ending your life? Have you attempted suicide?

(continued)

Appendix B (continued)

9) Anxiety

Is anything worrying you?

Have you been feeling nervous? Tense?

Would you please hold your hands out straight (to inspect for tremor)?

Now may I see your palms (to inspect for perspiration)?

Are you afraid of something? Of someone?

How anxious have you been feeling?

Do you ever get into a state of panic?

Have your worries or nervousness affected your appetite? Your sleep? Your ability to work?

10) Orientation

What day of the week is it? What is today's date (day, month, year)? What season are we in?

Where are we now located (city, state, district/burrough, and street address)?

What is the name of this hospital (clinic, etc.)? What ward (service, division, etc.) are we on?

What is the name of the doctor who is treating you?

What are the names of the other hospital (clinic, etc.) staff members? What are their jobs?

What are the names of some of your friends in the hospital (clinic, etc.)? What are the names of your friends at home?

Do you know the name of our Mayor (Town Supervisor, etc.)? Our Governor? Our President?

(continued)

PANSS Rating Manual

Appendix B (continued)

11) Abstract thinking*

A. Similarities

1. How are a ball and orange alike?
2. Apple and banana?
3. Pencil and pen?
4. Nickel and dime?
5. Table and chair?
6. Tiger and elephant?
7. Hat and shirt?
8. Bus and train?
9. Arm and leg?
10. Rose and tulip?
11. Uncle and cousin?
12. The sun and the moon?
13. Painting and poem?
14. Hilltop and valley?
15. Air and water?
16. Peace and prosperity?

(continued)

PANSS Rating Manual

Appendix B (continued) - Abstract thinking

B. Proverbs

What does the saying mean:

1. "Plain as the nose on your face"
2. "Carrying a chip on your shoulder"
3. "Two heads are better than one."
4. "Too many cooks spoil the soup."
5. "Don't judge a book by its cover."
6. "One man's food is another man's poison."
7. "All that glitters is not gold."
8. "Don't cross the bridge until you come to it."
9. "What's good for the goose is good for the gander."
10. "The grass always looks greener on the other side."
11. "Don't keep all your eggs in one basket."
12. "One swallow does not make a summer."
13. "A stitch in time saves nine."
14. "A rolling stone gathers no moss."
15. "The acorn never falls far from the tree."
16. "People who live in glass houses should not throw stones at others."

---

*Only a sampling of similarities and proverbs at different levels of difficulty (e.g., one item selected from each quarter of the full test sets) need be administered with the interview. When using the PANSS longitudinally, items should be systematically rotated with successive interviews so as to provide different selections from various levels of difficulty, thus minimizing repetition.

Appendix C

Number of Word Responses in a Single Word Association Test from Johnson (1990) study

	Response Type	
	Common	Individual
Stimulus Word		
boy	24	6
mountain	22	8
spider	23	7
lamp	17	13
sleep	21	9
beautiful	19	11
window	18	12
child	19	11
scissors	19	11
music	19	11
butterfly	20	10
earth	16	14
quiet	21	9

APPENDIX D

Cognitive Dimensions Scale for the Sentence Formulation Test

Code Types

1. *Well Clarified Responses.* Responses that appear to be explained in the context of a sentence and do not seem to fall into categories below of devisnt verbalizations.

   1a. Response rated "1" on the word association test is now meaningful and comprehensible in the context of a sentence.
   example: lean-friend "If you need someone to lean on, you can lean on a friend."

   1b. Response rated "1" on the word association test is now comprehensible in the context of a sentence, although with a minor, peculiar, or vague manner of expression—a syntactic anomaly.
   example: dream-blank "Well, when you dream you blank out—your mind has to be blank to dream."

2. *Mediated Responses.* Response is mediated via another association to the stimulus word.

   2a. Response that is mediated via another association that is made meaningful in the context of a sentence.
   example: king-zebra "Oh, from king I thought of the Hearst castle and then I thought of zebras I saw at the Hearst castle."

   2b. Response that is mediated via another association that remains nonmeaningful in the context of a sentence.
   example: lamp-pleasure "When you need a lamp to read a book to have pleasure."

3. *Personalized Responses.* Responses of personal meaning to the *S* that cannot be known to the examiner without further context.

   3a. Private, idiosyncratic responses that are made meaningful by the *S* in the context of the sentence.
   example: well—sister-in-law "My sister-in-law's father is in the business of making wells."

   3b. Private, idiosyncratic responses which remain nonmeaningful even in the context of a sentence.
   example: wallet-Arthur "Arthur is in my wallet."

4. *Phonetic Responses.* Responses based on an association to a word phonetically similar to the stimulus word.

   4a. Response phonetically mediated although *S* catches the error.
   example: race-anger "Oh, I was thinking of rage, rage-anger—race-anger doesn't make any sense."

   4b. Response phonetically mediated but *S* does not catch cognitive error.
   example: square-cupid "A square is different from a cupid."

5. *Semantically Ambiguous Responses.* The association continues to appear vague, unclear, or bizarre even in the context of a sentence as if there is a gap in communication.

   5a. Ambiguous, obscure, and distant responses, but in which the rater is able to presume a meaning in the association.
   example: mountain-choosing "We all have to choose our mountains but it seems like some choose anthills instead and then they complain about it."

   5b. Unusual, rare, uncommon responses in which an attempt is made to explain the association, but a meaningful relationship is not made clear.
   example: lamp-nightlife "The lamp is that which shines out in the night and produces its life."

   5c. Grossly bizarre or ideational responses in which a meaningful relationship appears not to exist to the rater, often reflecting gross intrusions of delusional material.
   example: paint-love "As I looked at her face I realized that her lipstick surgery was painted love."

APPENDIX D

6. *Unexplained Responses.* Either the *S* denies making the association, is unable to explain the association, or does not use the stimulus word-pair in the context of a sentence.

   6a. *S* at first is unable to give a meaningful response, but then successfully attempts to do so.
   example: king-China "I don't know. Oh, China has a king as a ruler."

   6b. Response is at first nonmeaningful to the *S* and remains so though the *S* attempts an explanation.
   example: fleet-continue "I don't know. It's like flight, fleet."

   6c. *S* does not attempt an explanation of the response which remains nonmeaningful.
   example: "I don't know." "I can't." "I made it up." "It doesn't make sense to me."

   6d. *S* uses neither the stimulus nor response word in the sentence.
   example: whistle-fall "At nighttime little ships have a light and a fog horn that guides the big ships to safety."

   6e. Both words are present in the sentence but the *S* does not organize the associative pair in a way that explains the association in the context of a sentence.
   example: hall-lobbies "In the hotel you stand in the lobby and then you stand in the hall."

7. *Elaboration on Either the Stimulus or Response Only.* Response based on explanation or further clarification of one of the two elements of the association, but *S* fails to explain the associative connection between the two.
   example: ocean-well "Well has a lot of water."

8. *Spoiled Responses.* One element of the explanation is meaningful, but as the *S* continues to explain, deterioration is noted sometimes by intrusion of drive-dominated material or personally over-involved thinking.
   example: butter-cereal "I put butter in my cereal and butter is a witch and the cereal is like an army of people that's going to destroy the butter."

Appendix E

Recategorization of the Cognitive Dimensions Scale for the Sentence Formulation Test

STRONGLY ASSOCIATED SENTENCES:

1a. Responses rated "1" on the word association test is now meaningful and comprehensible in the context of a sentence.

1b. Responses rated "1" on the word association test is now comprehensible in the context of a sentence, although with a minor, peculiar, or vague manner of expression - a syntactic anomaly.

9a. Ambiguous, obscure, and distant responses, but in which the rater is able to presume a meaning in the association.

LOW-GRADE ASSOCIATION SENTENCES:

2a. Responses that are mediated via another association that is made meaningful in the context of a sentence.

3a. Private, idiosyncratic responses that are made meaningful by the S in the context of a sentence.

6a. S at first is unable to give a meaningful response, but then successfully attempts to do so.

NOT-ASSOCIATED
(both words used in sentence and association was attempted)

2b. Responses that are mediated via another association that remains nonmeaningful in the context of a sentence.

5b. Unusual, rare, uncommon responses in which an attempt is made to explain the association, but a meaningful relationship is not made clear.

6b. Response is at first nonmeaningful to the S and remains so though the S attempts an explanation.

6e. Both words are present in the sentence but the S does not organize the associative pair in the way that explains the association in the context of a sentence.

Appendix E
(continued)

NOT ASSOCIATED
(both words used in sentence but with pathological intrusions)

3b. Private, idiosyncratic responses which remain nonmeaningful even in the context of a sentence.

4b. Responses phonetically mediated but S does not catch cognitive error.

5c. Grossly bizarre or ideational responses in which a meaningful relationship appears not to exist to the rater, often reflecting gross intrusions of delusional material.

8. One element of the explanation is meaningful, but as the S continues to explain, deterioration is noted sometimes but intrusion of drive-dominated material or personally over-involved thinking.

NOT ASSOCIATED
(both words can not be used together in a sentence)

6c. S does not attempt an explanation of the response which remains nonmeaningful.

6d. S uses neither the stimulus nor response word in the sentence.

7. Responses based on explanation or further clarification of one of the two elements of the association, but S fails to explain the associative connection between the two.

Not included in recategorization because no examples were noted:

4a. Responses phonetically mediated although S catches the error.

APPENDIX F

Ullman-Giovannoni (1964) Reactive Scale

Item content	Reactive
When I leave the hospital, I will live with my wife.	T
I am married now.	T
I have fathered children.	T
I have been married.	T
Before I was seventeen I had left the home I was raised in and never went back except for visits.	T
When I leave the hospital, I will live with one or both of my parents.	F
As a civilian I have worked steadily at one job or for one employer for over two years.	T
I finished at least one year of education after high school—trade apprenticeship, business school, college, etc.	T
Adding up all the money I earned for the last three years, it comes to less than $700, before deductions.	F
In my teens I was a member of a group of friends who did things together.	T
I hardly ever went over to another kid's house after school or on weekends.	F
When I was in school I didn't like Physical Education classes.	F
Alcohol has nothing to do with my difficulties.	F
I have paid regularly to buy a house.	T
More than once in the last year I have stayed on after some group meeting and talked with some other members about something that went on.	T
Shortly before I came into the hospital there was some major change in my life—such as marriage, birth of a baby, death, injury, loss of job, etc.	T
I have been deeply in love with someone and have told them about it.	T
In the kinds of work I do, it is expected that people will stay for at least a year.	T
My top wage in the last five years was less than $1.25 an hour.	F
I have earned my living for longer than a year at fulltime civilian work.	T
I have had to stay in a mental hospital for more than one year at a time.	F
Within the last five years I have spent more than half of the time in a mental hospital.	F
In my teens I was a regular member of a club or organization that had a grown-up who came to meetings. (Scouts, school club, 4-H, church youth club, etc.)	T
In my teens there was more than one girl with whom I had more than two dates.	T

Appendix G

Consent

I,_____, hereby agree to participate in Diane Johnson's research project. I understand that all information obtained by or about me will not be shared with anyone within or outside of the hospital and no information will be disclosed that will identify me. My name will not be associated with the information collected. I also understand that my performance on these tasks will not affect my status while in the hospital or after discharge.

I understand that I am volunteering for this study and any time I feel the need to drop out, I can do so freely and without consequence.

I give Diane Johnson permission to obtain the following information from my records: my age, marital status, education level, age of first admission, present medications, recent changes in medications, present diagnosis, score from the Wechsler Adult Intelligence Scale (intelligence test), and a social history. She may also obtain information from clinical notes of the past month.

I give Diane Johnson permission to administer the following tests:

The Kent-Rosanoff Word Association Test where I am required to respond verbally to words and make them into sentences

Three subtests of the Wechsler Adult Intelligence Scale-Revised where I am required to arrange colored blocks, look at pictures, and answer questions

The Positive and Negative Syndrome Scale interview where I am required to respond verbally to questions about myself

I understand that there are minimal known risks associated with these tests, and that I will be told if any unforseen risks develop in the future. I also understand that Eastern State Hospital will provide any medical care should it be needed.

I understand that if I have any questions or problems about these procedures, I can direct them to Dr. Richard Bloch at 253-5478. Diane Johnson is also available at 253-5583 to answer any inquiries at any time.

_____ _____

Signature of Patient Witness

_____ _____

Date Date

Appendix H
PANSS INTERRATER ITEM ANALYSIS
Pearson Correlations and % Agreement (N = 27)

	Pearson	%
Positive Symptoms:		
Delusions	.83	96
Conceptual disorganization	.66	93
Hallucinatory behavior	.83	93
Excitement	.58	85
Grandiosity	.58	85
Suspiciousness/persecution	.54	63
Hostility	.68	89
Negative Symptoms:		
Blunted affect	.42	67
Emotional withdrawal	.39	74
Poor rapport	.57	78
Passive/apathetic social withdrawal	.44	78
Difficulty in abstract thinking	.65	85
Lack of spontaneity and flow of conversation	.53	78
Stereotyped thinking	.01	89
General Psychopathology:		
Somatic concern	.68	89
Anxiety	.16	93
Guilt feelings	.63	96
Tension	.36	93
Mannerisms and posturing	.64	100
Depression	.46	81
Motor retardation	.53	81
Uncooperativeness	.24	74
Unusual thought content	.74	96
Disorientation	.85	93
Poor attention	.68	89
Lack of judgment and insight	.64	89
Disturbance of volition	.63	93
Poor impulse control	.57	89
Preoccupation	.33	85
Active social avoidance	.27	70

VITA

Diane Elizabeth Johnson

The author was born on December 29, 1957 in Washington, D. C. She received her Bachelor of Science in dental hygiene from the Medical College of Virginia of Virginia Commonwealth University, and entered the Master of Arts program in psychology at the College of William and Mary in August, 1988. Her first year project, entitled "Word Association and the Symptoms of Schizophrenia", was presented to the Southwestern Psychological Association in April, 1990. The author will pursue her doctoral degree in clinical psychology this fall at the University of North Carolina at Greensboro.